

## Attention for fetomaternal and obstetric outcomes of advanced maternal age: a broad range clinical evaluation

Fetomaternal and obstetric outcomes of advanced maternal age

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### Abstract

**Aim:** Pregnancy  $\geq 35$  years may lead to different health problems in neonates. The present study was aimed to investigate the effect of pregnancy  $\geq 35$  on maternal and infant health. **Material and Method:** Mothers of the neonates in our neonatal unit were separated into two groups and compared: Group I comprised those between 18 and 35 years old, and Group II comprised those  $\geq 35$ . **Results:** Out of 1.193 mothers, 22.1% (264) were above the age of 35 years, whereas 77.8% (929) were under the age of 35 years. However, there was no significant difference between the groups regarding gender, number of previous delivery, gestational week, the rate of neonatal mortality, polyhydramnios, and oligohydramnios. A statistically significant increase in gestational diabetes, the rate of cesarean delivery and the rate of delivery meconium aspiration syndrome and occurrence of preeclampsia were found in the group for those with advanced age than the other group. **Discussion:** Much attention should be taken in terms of developing preeclampsia and gestational diabetes in advanced maternal age pregnancies. For a closer follow-up of pregnant women  $\geq 35$ , establishing relevant units and referral of mother candidates at this age to experienced centers may help to decrease the higher fetomaternal risks for advanced maternal age population.

### Keywords

Advanced Maternal Age; Newborn; Preeclampsia; Low Birth Weight; Pregnancy

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## Introduction

Pregnancy above the age of 35 years is referred as “advanced maternal age (AMA)” and it is considered a high-risk pregnancy. In recent years, the age of having children has been postponed until the age of 35 or later due to a number of factors such as safe contraceptive methods and change in the social role of women, second marriage, prolonged education, low-income, delayed financial freedom, efforts in career, and economic imperatives [1]. Furthermore, new reproductive technologies against infertility may also lead to the delayed age of pregnancy for example, a study conducted in the UK revealed that, the prevalence of AMA is around 12.6% in the UK [2]. In a recent study conducted in Turkey, the mean age of women who applied for a medical report before getting married was 26.8 which indicates a high probability of having second or third child for these women when they are above the age of 35 [3]. According to some publications in various countries, pregnancy the age of  $\geq 35$  has been classified as “high-risk pregnancy”, which may lead to severe complications in both pregnancy and infant [4, 5]. High-risk pregnancy is particularly important as it has increased risks of mortality and morbidity in the mother, fetus, and neonates at different stages of delivery [6]. There are many studies in the literature about the effects of advanced maternal age on perinatal period, maternal health, and neonates [7, 8]. In this article, we evaluated the effects of AMA on a broad range of clinical conditions which are the mode of delivery, gestational age at delivery, birth weight, parity, APGAR scores, neonatal mortality and incidence of gestational diabetes, preeclampsia, polyhydramnios, and oligohydramnios. The aim of this study was to investigate the effect of advanced maternal age on perinatal complications in Diyarbakir province.

## Material and Method

The Neonatal Unit in Dicle University is a third level intensive care unit for neonates with 34 inpatient beds. In addition, this unit has the capacity for inbound patients who have poor manifestation from other hospitals located in various provinces in the Southeastern and Eastern Anatolia regions of Turkey. A total of 1.193 neonates that were hospitalized were enrolled in our study. Access to their files between January 1, 2010, and December 31, 2011, was granted upon patient consent. Nine hundred twenty nine (929) of neonates were the infants born to mothers between 18 and 34 years old, while 264 were born to mothers  $\geq 35$  years old. The patients were separated into two groups: Group I, comprised those between 18 and 35 years old and Group II, comprised those  $\geq 35$  years old.

Each file of the infants was examined and data such as gender, delivery route, gestational week, birth weight, parity, APGAR scoring, neonatal mortality, gestational diabetes, preeclampsia, polyhydramnios, and oligohydramnios were recorded. The first delivery information was used for mothers who gave birth twice or more in our hospital. The study procedure was approved by the Dicle University Faculty of Medicine, Non-invasive Clinical Trials Ethical Committee (Date: 27/11/2015 Decree No: 411f).

## Statistical Analysis

The statistical analysis of data was performed using SPSS v.18 software (SPSS Inc., Illinois, CA, USA). The mean, standard

deviation, numbers and percentages were calculated as descriptive statistics. In the comparison of two groups, student t-test was performed for numerical values obtained from measurement conforming to the normal distribution. Chi-square test was used to compare qualitative values between the groups. A p-value of less than 0.05 was considered as statistically significant.

## Results

Comparison of the study groups showed statistically significant differences with regard to birth weight and first minute APGAR scores. The mean birth weight of the newborns was higher in group II than group I ( $p=0.02$ ), and low APGAR score was significantly higher in group II compared to group I ( $p=0.026$ ) (Table1).

When compared to the Group I, infants born to mothers with diabetes, cesarean delivery rate, the frequency of meconium aspiration syndrome, and incidence of preeclampsia were statistically significantly higher in Group II ( $p=0.004$ ,  $p=0.006$ ,  $p<0.001$ ,  $p<0.001$ , respectively)(Table 2). Duration of hospitalization for group II patients was significantly longer than for group I ( $p=0.01$ ) (Table 3).

Table 1. The comparison of Fetal Characteristics between two maternal age groups

Maternal Age	18-34 years old		$\geq 35$ years old		P
	N	%	N	%	
Gender of newborn					
Female	397	42.7	121	45.8	0.37
Male	532	57.3	143	54.2	
Gestational age					
<32 week	248	26.7	65	24.6	0.26
32-37 week	289	31.1	85	32.2	
>37 week	392	42.2	114	42.4	
Birth Weight					
<750 gr	8	0.9	1	0.4	0.02
751-1000 gr	73	7.9	12	4.5	
1001-1500 gr	118	12.7	41	15.5	
1501-2500 gr	299	32.2	74	28	
2501-4000 gr	424	45.6	129	48.9	
> 4000 gr	7	0.8	7	2.7	
1' APGAR score					
0-3	9	3.2	6	4.2	0.026
4-7	275	96.8	80	94	
Neonatal Mortality	206	22.2	48	18.6	0.093

Table 2. The comparison of findings between two maternal age groups

Maternal Age	18-34 years old		$\geq 35$ years old		p
	N	%	N	%	
Infant of Diabetic Mother	32	3.4	20	7.6	0.004
preeclampsia	185	19.9	89	33.7	<0.001
polyhydroamnios	65	7	14	5.3	0.3
Oligohydroamnios	63	6.8	16	6.1	0.6
Meconium Aspiration Syndrome	52	5.6	32	12.1	<0.001
Multiple delivery	95	10.2	24	9.1	0.5
Caesarean birth	528	56.8	175	66.3	0.006

Table 3. The comparison of hospitalization duration between two maternal age groups

Maternal Age	18-34 years old		≥ 35 years old		p
	Mean	SD	Mean	SD	
Duration of Hospitalization	10.8	12.8	19.1	13.6	0.01

## Discussion

Today, many women, especially in developed countries, are known to postpone motherhood until the fourth decade due to a number of reasons such as social, economic and educational [9]. A study conducted in Austria in 2013 revealed that the pregnancy rate of advanced age was 66.4% [10]. In a study of Yi Hao et al. cesarean section (C/S) delivery rate was found to be higher in women ≥35 years old, while 15.3% was found in another study conducted in Turkey (based on meta-analysis data between 2009 and 2012) [11-12]. Cesarean was associated with 3–5 times higher risks for maternal death, twice higher for hysterectomy and intensive care admission compared to vaginal delivery. Moreover, rates of postnatal infection, thrombosis, pulmonary embolism, and excessive blood loss were higher after C/S [13].

Çetinoğlu et al. compared women above the age of 40 years with those between 35 and 39 years old, and reported the cesarean rate as 67.3% and 65%, respectively [14]. On the other hand, Smit et al. reported the cesarean rate as 25.7% in the group above the age of 35 years in a meta-analysis study conducted over 297.842 women, conversely [15]. Hoque et al. reported it as 38.4% (n=341) in pregnant women above the age of 35 years [16].

In this current study, the pregnancy rate of women aged ≥ 35 years, was found to be 22.1%, suggesting increased incidence of advanced age pregnancy as well as increased health problems. Similarly, we also found the cesarean rate to be higher in elder mothers in our study. In addition, this data may indicate a more frequent hospitalization requirement for infants born to women with advanced age. Mother's age had no effect on the fetal birth week. These findings are in accordance with other publications that investigate the relationship between advanced maternal age and delivery week. It is known that fetal complication rate is high in infants with low Apgar score. In this present study, low Apgar score ratios were found higher in the advanced maternal age group. Both this study and the study by Wen et al. suggested a correlation between AMA and lower Apgar scoring whereas Benli et al. revealed no difference between those above and under the age of 35 years [17,18]. In our study, the proportion of infants with higher Apgar score was higher in group I. In the literature, there are contradictory publications about the effects of the development levels of countries on fetal mortality. According to some studies, fetal mortality has no correlation with the pregnancies above the age of 35 years [19]. On the other hand, Kamal et al. found that neonatal mortality was higher in advanced maternal age as compared to those under the age of 35 years in Bangladesh [20]. This current study suggests that maternal age has no effect on neonatal mortality for infants born to women ≥ 35 years of age. Pregnancies in advanced maternal age have higher C/S rates, since hormonal and physiological alterations

associated with labor are essential for pulmonary maturation; C/S can result in an increased risk of respiratory morbidity in neonates with 3–5 times higher risks rate of fetal mortality [21]. Advanced maternal age is an important risk factor for the development of postpartum fetal complications in our study. The rate of unwanted pregnancy problems seen after childbirth approximately twice as high in advanced ages [13, 22]. Unintended consequences of AMA are rising health care costs, and maintenance requirements after discharge from hospital. Monitoring and treatment the signs and symptoms of early pregnancy complications may be effective in the management of patients. Additionally, pregnant women at AMA should be recommended to have check-ups more frequently and regularly. Hence, unintended pregnancy at advanced ages may be avoided. Limitations of study: The data collection process of our work was limited to one year because of high birth rates and the number of files. The multicenter study could be carried out but our data was used only from our own hospital.

## Conclusion

Pregnancy complications are more common in advanced maternal age group. During consultancy service, patients that wish to continue their fertility over 35 years of age or those that are primigravid and intend to have another pregnancy after 35 years of age should be informed about the possible risks. We anticipate that advanced maternal age will decrease the complications related to pregnancy both during the antenatal care and puerperal period. Our suggestions will help women who are planning to become pregnant to be informed about possible complications due to advanced age and contribute to the literature on the necessary precautions.

## Scientific Responsibility Statement

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

## Animal and human rights statement

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## Conflict of interest

*None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.*

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